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ON IRRIGATION AND MANAGEMENT OF WATER.

Boston, 3d May, 1840.

Rev. Mr. Colman—*Sir:*—Please to accept my thanks for your report containing the remarks on agriculture in England, by Mr. Webster and Mr. Silliman. I am much pleased to find that my own remarks are in accordance with the opinions of those distinguished citizens; and I am encouraged by this accordance to offer a few more observations on the modes of supplying and using water.

In my preceding letter, it was my principal object to draw attention to the constituent and creative powers of water and air; and had I known that this fact, (long since familiar to men of science,) had been presented to our farmers under the auspices of such names as those above, I might have omitted burthening your columns with my own speculations.

In every science it is necessary to have some fundamental truth as a point of departure—a sure test to which we may always refer to prove all ulterior deductions. Water, air, light and heat, then, it is admitted, constitute the great chemical lever, by which the vegetable kingdom is raised, and the inert earth is the fulcrum on which it acts.

As far back as I can remember, irrigation has been practised in our country, although not so commonly as in Europe. The English mode described by Mr. Webster, I have often seen in this State, where springs were at command. The use of a copious spring for this purpose, by General Hull, on his farm in Newton, gave rise to a suit between him and a manufacturing company, who complained against this use of the water, as it passed through his farm, contending that it diminished the power of the mill. The suit was decided against *agriculture*, but on what principles, I must leave profounder jurists to determine. If the great and commendable temperance reform had then been in operation, the mill company might have added to their complaint that the General drank too much of the water as it passed over his land. I can find no where in the code Justinian or the code Napoleon, any inhibition against the use of water for irrigation, in its passage over the successive farms. Perhaps when the importance of the agricultural interest becomes better understood, and the creative power of water better known, our intelligent legislators from the country will settle this question by statute.

In the conclusion of my last letter, in your paper of the 22d April, my allusion to the mode of retaining water on high grounds, for irrigation or other purposes, was not so clear as I could wish. I was absent, you are aware, and could not examine the proof. There are few farms which have not some place where water may be stopped and retained for future use. Some natural cavities, with a little labor, could be converted into ponds. Many narrow gorges between neighboring hills, may be made into reservoirs, by a short dam; and in both cases, if the earth be of gravel or sand, and too loose to hold water, it may be puddled with clay, or it will in a short time become impervious, by the natural sediment. These artificial reservoirs will be kept always full by the rain alone, provided they have the wash of a small quantity of land more elevated; and then they may be used for the irrigation of all lower lands, for supplying aqueducts, or even for watering cattle, and thus save the labor and waste of driving cattle over productive grass land to reach some distant spring. In Europe, where there is the smallest spring it is used to create artificial fish ponds, and in passing from one pond to the next, it is made to irrigate the intervening ground; and I never heard that the owner of the lower pond or ground instituted suits against his neighbor above for using the water.

The *Noria* (wrongly spelt in my last letter *Norice,)* may be used with economy, where much water is wanted from a well for cattle, or in case of a great drought, perhaps, for a garden. The *Hydraulic Ram*, which requires a small waterfall, I shall describe, as soon as I have time to draw you a diagram, on which a mechanic could execute it. But the *Syphon*, to which I alluded in my last letter, requires some further notice. I am somewhat proud of this application of that old instrument, for I never read or heard of its being used for agricultural purposes before I proposed it in France, more than forty years ago.

Let us now suppose that you have a sloping field to the south, which you would convert into a meadow; and there be on the opposite declivity of the hill, at some thirty or forty feet below the summit, a copious spring. It may be too far to carry the water round the hill from this spring, or you may not own the land over which it must pass to get round. (This was my case in France.) Now the process is simply this. Dig a reservoir about the spring. If it be a quick spring the reservoir need not be large: make a trench over the hill for the syphon to lie in. The trench need be only deep enough to be clear of the frost, excepting at the summit of the hill, and there only in case it be necessary to reduce the elevation to thirty feet above the reservoir; for the syphon will not draw beyond that elevation. The arm of the syphon, or crane, which enters the reservoir, is the short arm; the other arm, on the opposite side of the hill, must be a foot or two longer. Now to put

this crane in operation, instead of drawing it by the breath, as usual, which would be impossible, both ends must be stopped—the end of the short arm being under water near the bottom of the reservoir,—then a hole must be made in the highest part of the syphon, if it be of wood, or if of metal, a short arm, three or four inches long, soldered in that place, through which hole or arm the syphon is to be filled with water by a tunnel. When so filled, and corked, forcing the cork down upon the water as much as possible, the stoppers may be taken out of both ends of the syphon at the same time, and it will continue to run as long as there is any water in the reservoir. Now, to avoid the necessity of renewing this operation, if the water should be exhausted, there must be a cock at the end of the long arm, or the diameter of the opening there must be calcuiated to take no more water than the spring will constantly supply: then it will run forever, or so long as the aqueduct remains sound. In performing this operation, it is necessary to guard against the retention of air in any part of the syphon, therefore, where any considerable portion of it runs over a plain, undulations must be avoided—otherwise, the air would be confined in the summits of these undulations, and could not escape, having the water on both sides, and filling the whole bore of the syphon.

If it be desirable to bring water from a well, a pond, or a river, at a considerable distance over a plain, or irregular ground, where there shall be no greater elevation on the route than thirty feet, this may be done with the syphon; and cannot be done otherwise, without digging a trench the whole distance, as deep as the water is at the source, at its lowest depth. This process was described in my last letter, in the case of Mr. Chapman's wells in Charlestown. The receiving well or reservoir at the place where the water is wanted, must be a little deeper than the lowest surface of the water at the place from whence it is to be drawn; and the arm of the syphon longest, in the *home* reservoir; the water then will remain in that reservoir on the same level as in the river, pond, or other source. It will be seen by this process, an abundant supply of good water may be had so near the surface as to be dipped out, in many cases; and in such cases, with no other reservoir than a sunken tub. It is also apparent that an inexhaustible supply of water so easily had, would authorize other attempts to use it for watering gardens, or even level fields, on a large scale, in very dry seasons.

The syphon may be used to drain swamps or ponds, where a lower point is not too distant, and where the intervening ground is of rock, or too high to drain them in the usual way, by a ditch.—Some swamps may be drained even without any lower place to take off the water, provided a very loose soil can be found by digging wells in the neighborhood, and placing therein the long end

of a syphon, communicating with the swamp. Finally, the syphon may be used to transport water from one stream to another, running in an opposite direction, when it is desired to increase one of them for manufacturing purposes: the syphon in such cases may be made large enough to take all the water out of one of the sources.

It would be remembered that, although a pump be a very ingenious contrivance, and well suited for a house or stable, it should not be used, where labor is high, for purposes which require a great consumption of water. The ingenuity of my countrymen will devise various modes of raïsing water for a few feet; and they will always find, that the simplest is the best mode.

To return for a moment to that hydraulic apparatus which draws water from the air, viz. the woods, I would ask our oldest inhabitants of the country, whether they do not remember many small ponds, springs and brooks, in former times, which do not now exist? If so, I call this fact as a witness in favor of keeping good that source, as long as possible, by leaving wood on our hills. The diminution of wood lands, must be the cause of the diminution of water alluded to; and it is quite possible that some of our good mill powers will cease to be so, at no distant period.

The water retained on high grounds and in the gorges of the hills, as recommended in the beginning of this article, will be taken up in part by the surrounding woods, and contribute to their growth. And being arrested and conducted in channels for irrigation, it will then cease to run down in torrents, carring away, in its course, the soil and sometimes covering rich medows with sand or gravel.

In that part of France where I lived, there was much rain, and places where there was too much water, like those noticed in England, by Mr. Webster; and the French have been in the habit of getting rid of this superfluous water in a way somewhat similar to that described by Mr. Webster, but better suited to our stony country. They dig trenches sufficiently deep to be out of the way of the plough, and lay loose stones in them, and after covering these stones with brush and stubble, replace the earth, and drain the land without loss of any part of it.

I believe that many of our bogs may be raised, and turned into rich meadows, so as to pay well for the labor, where stone, gravel, or sand is near. For example, ditch this land in the dry season with ditches six feet wide, and twelve feet apart; then fill these ditches with stones, gravel or sand, in the winter, when the cattle and the men have little to do. It will be easy carting over the level ice in these ditches, where the stone, &c. may remain and fall in when the thaw comes. I would not, however, advise any great outlay of money for such works, but merely to use them as a savings bank to receive the odds and ends of leisure hours.

[*New England Farmer.*

HOW CAN FARMING BE MADE PROFITABLE?—SUBSOIL PLOUGHING.

Letter of E. Phinney, Esq. to A. Huntingdon, Esq., published in the Transactions of the Essex Agricultural Society, 1840.

A. HUNTINGDON, ESQ.—Dear Sir—The question is often asked, How can farming be made profitable? I answer, by liberal manuring, deep and thorough ploughing, and clean culture. I will venture to affirm, without fear of contradiction, that no instance can be cited, where a farmer who has manured his grounds highly, made a judicious use of the plough, and cultivated with care, has failed to receive an ample remuneration for the amount invested—nay more, that has not received a greater advance upon his outlay than the average profit derived from any other business. One great difficulty is, that most farmers seem not to be aware of the fact, that the greater the outlay, to a reasonable extent, when skilfully applied, the greater will be the profit; they therefore manure sparingly, plough shallow, and the consequence is, get poorly paid for their labor. This has raised a prejudice and given a disrelish to the business of farming, especially among those who are in the habit and are desirous of realizing something more from their occupation than a naked return of the amount expended.

The farmer who is so sparing of his manure that he can get but thirty bushels of corn from an acre, gets barely enough to pay him for the expense of cultivation; and in addition to this, by the ordinary method of ploughing, his field, at each successive rotation, is deteriorating, his crops becoming less, and in a few years he finds he must abandon his exhausted and worn out fields, to seek a subsistence for himself and family in some other business, or in some other region, where the hand of man has been less wasteful of the bounties of nature.

Instead then of his scanty manuring of ten cart-loads to the acre, which will give him but thirty bushels of corn, let him apply thirty loads. This additional twenty loads, at the usual price of manure in this part of the country, will cost him thirty dollars. But he now, instead of thirty bushels of corn, gets sixty bushels, and the increased quantity of stover will more than pay for the excess of labor required in cultivating and harvesting the large crop over that of the small one. He has then added thirty bushels of corn to his crop by means of twenty loads of manure, which at the usual price of one dollar per bushel, pays him in the first crop for his extra outlay. His acre of land is laid to grass after taking off the corn, and the effect of his twenty loads of additional manuring, will be to give him, at the lowest estimate, three additional tons of hay in the three first years of mowing it, worth fifteen dollars a ton standing in the field. Now look at the result. His thirty

dollars expended for extra manuring was paid for in the first year's crop, and at the end of three years more he will have received forty-five dollars profit on his outlay of thirty dollars: and in addition to this, his land is improved, and in much better condition for a second rotation. There is no delusion in this. It is a practical result, of the reality of which any farmer may satisfy himself, who will take the trouble to try the experiment.

From no item of outlays can the farmer derive so ample and so certain a profit, as from his expenditures for manure to a certain extent. This has been most strikingly verified by some of our West Cambridge farmers. It is not uncommon among some of the farmers in that town, to put on their grounds one hundred dollars' worth of manure to the acre, and in more instances than one, the gross sales of produce from ten acres under the plough, have amounted to five thousand dollars in one season. This is the result of high manuring and judicious cultivation of a soil too which is exceedingly poor and sandy.

The subject of subsoil ploughing is one upon which there has been little said, and less done, in this part of the country. In all our grounds, except those which are very loose and sandy, there is no doubt that great benefit would be derived from the use of the subsoil plough. In England, the effect of subsoil ploughing in increasing their crops, as stated by some agricultural writers, would seem almost incredible. By this means, the crops in that country have been doubled, and in many instances trebled. The expense however, is stated to be very great—so great, as to go beyond the means of most of our farmers. In one case the expense of subsoil ploughing on a farm of over five hundred acres, was estimated by the owner to cost the enormous sum of thirteen hundred pounds sterling. This calculation took into consideration the use of the heavy Deaston plough, which always required four, and in some stiff clays, six horses to work it. I am aware that an implement might be constructed, which though it might not do the business quite so well, could nevertheless, be made highly beneficial in the hands of our farmers, and obtained at a far less cost. I am informed that Mr. Bosson, of the Yankee Farmer, has, with a highly praise-worthy zeal in the interest of agriculture, imported from England a subsoil plough, which may be worked with a less powerful team than the one commonly in use in that country.

In a climate like our own, which at that season of the year when our crops, particularly our root crops, most need the benefit of moisture that may be derived from deep ploughing, and are most likely to suffer from drought, the use of the subsoil plough would be attended with unquestionable benefit. On a field of my own, which had been set to an orchard, and therefore kept under the plough for some years, in attempting to underdrain a part of it that was usually flooded by water in the spring of the year, I noti-

ced what the English call the "upper crust." This lay some inches below the surface, at the depth to which the land had been usually ploughed, formed by the treading of the oxen and the movements of the plough over it. This I found to be so hard as to be apparently as impenetrable by the roots as a piece of marble, and discovered to me at once the cause of the failure, in a great measure, of my crop of potatoes the year before. Having discovered what I supposed to be the cause of the failure, I set about devising measures to remedy it.

I have never seen a subsoil plough, there never having been one seen or made in this part of the country. I consulted my ingenious friends, Messrs. Prouty & Mears, and, at my request, they made an instrument of very cheap and simple construction, consisting of a wooden beam, about three inches square, and three feet long, with three tines or teeth of the common cultivator, placed in a direct line in the beam, extending about eight inches below the beam; to this handles were attached similar to the handles of a plough. On trying this by running after the drill plough, I found, in my hard stony subsoil, it was quite inadequate to the business, being too light and of insufficient strength. I then had one constructed of similar plan, but much heavier and stronger. The beam five feet long, six inches square, of white oak, well ironed, with three tines in nearly a right line, made of the best Swedes iron, one and a half inches square, extending twelve inches below the beam, with a spur at the foot, some less than that of the tine of the cultivator, with strong handles and an iron beam extending from each handle to the centre of the beam, by which the balance is easily preserved. This implement, drawn by two yoke of oxen, followed the drill plough in getting in carrots, and performed the work better than I had anticipated. The "upper crust" gave way, the resistance made by the hard gravelly bottom and smaller stones was readily overcome. The earth was loosened in most places twelve or fourteen inches from the surface, and though not so thoroughly pulverized as it probably would have been by a perfect subsoil plough, yet, in my very hard, stony subsoil, I am inclined to believe, that for simple drill husbandry, this will be found to be a valuable substitute for the English subsoil plough. And considering the small price of the implement, and the greater ease with which it is worked, the friction being much lessened by dispensing with the sole, I shall continue to use this until I can find a better. A part of my crop of carrots was sowed upon the same land appropriated for that crop last year; no more manure was applied than in the previous year, and notwithstanding the severe drought which greatly injured most of our root crops, my crop on this piece of land was nearly double to that of last year. There is no known cause to which I can attribute this great increase of the produce, but the use of my new constructed substitute for a subsoil plough.

The soil was stirred to the depth of fourteen inches; by this means the roots of the carrots were enabled to strike deep, and thereby not only find more nourishment, but to overcome, in a great measure the effects of a very pinching drought.

With great respect,
Your obedient servant,

Lexington, Mass. E. Phinney.

[*New England Farmer.*

MANURING GROUND.

If you would have sound and large crops, put on the manure liberally. Don't think to cheat mother earth with the *appearance* of granting her an ample allowance of the food of plants, for she will tell the truth and the whole story in the proper season.

There is not, generally, care enough taken when applying manure to the earth, to mix it well with the soil. All the lumps both of manure and of earth, should be broken finely up, and the soil stirred till the whole is mixed intimately together. Roots do not want to find a large lump of hard manure of the size of a man's head, in one place—a lump which they can hardly penetrate, and which may be strong enough to kill the roots as they approach it, and then have to travel over a square yard of poor unmanured soil, getting no nutriment by the way, before it finds another undigestible lump of rank food. The food of plants should be as well broken up and mixed before it can go into the bodies of vegetables, as the food of animals is after mastication. We repeat, therefore, mix the manure well and equally with the soil, if you would give your plants the best chance.

We said "put on the manure liberally;" but we *did not* say, put it on extravagantly or prodigally.

There is such a thing as giving the earth too much, and creating a surfeit for the plants. By this means vegetation is as much injured as is the friend whom you would treat hospitably when you force him to eat too hearty food or too much of it. The best plan is to give the soil just as much as the crop you put on it can and will eat up in the course of the season, leaving the earth in autumn, in about the same state for richness that it was when you began upon it in spring. When manure beyond what the plants can take up in one season, is applied to and left on the ground, that portion becomes inert and dead, doing more hurt than good, because it produces a gangrenous state of soil, which will greatly injure the crop the next year. It is for this reason that old gardens that have been long and extravagantly enriched, will not produce good potatoes and beets. They will be warty and wormy, from this cause.

Keep the ground just lively and healthy, by applying *as much* manure, as the plants, which work hard all summer growing, can eat up and convert into seed; but be careful to apply no more. At least we have always found this to be the best system.

[*Maine Cultivator.*

AGRICULTURAL ANALYSIS.

To determine the value of soil, or to be able to correct any fault in the original constitution, or any deficiency arising from improper cultivation, it is necessary that the nature and proportion of the substances composing it should be understood. In agriculture this examination is termed analysis; and in its simplest, yet still effectual method, may be practised by every farmer. The implements used are a pair of scales, accurate to the tenth part of a grain; a crucible; some muriatic acid, and a few small vessels of china or glass.

The earth to be tested by the farmer, should be taken from a few inches below the surface, and be an average specimen of the field, or the soil to be examined. The quantity to be examined, say two or four hundred grains, is to be slightly pulverized or well mixed together. Put of this, two hundred grains in a crucible, and heat it to three hundred degrees of Fahreinheit, or bake it in an oven heated for bread for fifteen minutes; cool and weigh. This will show the absorbent power of the soil, and as this is depending mainly on the animal and vegetable matter, if the loss is considerable, it is decisive proof in this respect of fertility. The absorbent power varies from one to twelve per cent.

After weighing, heat it again in the crucible to a red heat, and until the mass shows no bright or sparkling particles, stirring it with a glass or iron rod; cool and weigh, and the loss will be the animal and vegetable matter in the soil.

Take two hundred grains of the dried earth, mix it thoroughly with a gill of water, by stirring it for several minutes. Let it stand for three minutes, and turn off the muddy water into another glass. Dry the sediment in the first glass at high heat, weigh, and it gives the silicia contained in the soil. Let the water turned off settle clear, turn it off, dry it at a high heat and weigh: this gives the alumini or clay.

Put into a suitable glass or flask, one-fourth of a gill of muriatic acid and water in equal proportions, and balance the scales carefully. Put into this mixture one hundred grains of the earth, let it stand till all the effervescence has ceased, which will sometimes be an hour, or more; carefully note the weight required to again balance the scales, and that may be set down as the weight of

carbonic gass expelled, say six grains. Then as forty-five is to fifty-five, so is this weight to that of the base, or the lime. In this case the lime would be seven and one-third per cent.

To ascertain if the earth contains iron, stir the muriatic acid and water with a strip of oak bark and if iron is present in the liquid, the bark will turn dark. To ascertain the quantity, put in prussiate of pot-ash, till it no longer forms a blue precipitate, let it settle, heat the deposit to redness, carefully weigh the remainder, which is oxide of iron.

To determine the presence of gypsum, take one hundred grains of earth, mix one-third the quantity of powdered charcoal, keep it at a red heat in a crucible for half an hour. Then boil the earth in a pint of water for thirty minutes, filter the liquor, and expose it for some days in an open vessel. A white deposit will be sulphate of lime, and the weight will determine the proportion.

These processes are all simple, and can be performed by any one. By them we obtain, 1st, the absorbent powers; 2d, the amount of animal vegetable matter; 3d, the silicia or sand; 4th, the alumini, or clay; 5th, the carbonate of lime; 6th, the oxides of iron; and 7th, the gypsum or Plaster of Paris. The salts exercise a great influence on vegetation; but as they principally depend on the animal and vegetable matter in the soil, and as the determining their qualities and kinds are too difficult for the analysis of the farmer, the processes are omitted. The above ingredients are all that exert a marked influence on the fertility of soils, and on their proper proportion its goodness depends. If soils contain too much silicia or gravel, they are porous; and if too much clay, retentive. The last is usually the worst fault, and may be known by the water standing upon it after rains, remaining unsettled for a long time, owing to the clay held in solution. Wheat, winter kills, on such soils; on calcarous, gravelly ones, rarely. Good soils usually contain from sixty-five to seventy-five of silicia; from ten to sixteen of alumini; from four to ten of lime, and varying proportions of vegetable matters, animal and mineral salts, &c. The analysis of soils, forms one of the most decided steps in the improvement of agriculture, as it clearly points out what is wanting to remedy any defect, and give ease of working, and abundance in product.—Every farmer should understand the nature and composition of his soils, and may do so with little time, and at a mere trifle of expense. [*Gen. Farmer.*

REPORT OF THE COMMITTEE APPOINTED BY THE AGRICULTURAL SOCIETY OF CAMBRIDGE, (S. C.) ON COTTON.

The Committee to whom was referred the consideration of Cotton, beg leave to Report,

That they have bestowed upon the subject, all the attention demanded by its great and intrinsic value; and now respectfully submit the result of their deliberations to the notice of this Society.

There are few subjects that demand so much of the attention of the Southern Planter, and in which his pecuniary interest is so much involved, as the production of this great staple. And no other Agricultural production calls into requisition so many of the intellectual powers of man.

The Cotton tree or shrub is an indigenous plant, growing spontaneously in various parts of the South and South-West, but it is by the strictest attention and greatest pains, that it can be sufficiently domesticated to become of any practical utility to man. And from the weakest and most feeble of all plants, it becomes by the care and industry of man, the undisputed Sampson of the vegetable world.

The selection and preparation of the soil, for the best production of this useful commodity, admit of such conflicting opinions among mankind, that your Committee will be necessarily compelled, (confined within the narrow limits of a report) to give *only* the result of their own experience and observation.

The soil most suitable, for the production of Cotton, in this section of our common country, is the *light brown* mulatto soil; participating in the nature of both clay and sandy soils, being thus comingled, it is rendered much more productive. The clay soil being too tenacious, and the sandy, too porous, to admit of that rapid growth, which might be reasonably anticipated in this tender plant.

In the preparation of the soil; it is a conceded point that deep and thorough ploughing is indispensable; and your Committee beg leave to suggest the propriety of making large and high *beds*. They can be most easily made with large twisted ploughs, afterwards drawn up with hoes. No rational man will, for a moment question the propriety of this process in low and flat lands, and your Committee contends it is not without its advantages even in uplands. Because it may be assumed as a fact no longer subject to controversy—the more elevated the *beds*, the sooner will they be warmed in the spring by the genial rays of the sun, the sooner will the embedded seed be germinated, and the more rapid will be the growth of the young and tender plant; also the land is less subject to become hard and baked from rains and storms; and it is more easily cultivated; perhaps the time that may be considered

as lost in the preparation, is regained in the cultivation, to say nothing of the great gain in production.

Your Committee deem it expedient to recommend that these *beds* should be pretty well filled with manure, especially in old lands. It is presumed that no one will, for a moment, doubt that stable or compost manure, is to be preferred to any other kind; but when we contemplate the great quantity necessary per acre, we are driven to one or two alternatives, either to abandon the process of manuring, or search for a more convenient plan.

The quantity of compost or stable manure requisite for an acre of Cotton land, is five wagon loads; 250 loads upon 50 acres. But most fortunately for the planter, nature has provided, at hand, an excellent substitute, as stalks, leaves, straw, &c. &c., whose preparation require not half the labor.

Your Committee would respectfully suggest that a deep furrow, as early in the season of preparation as practicable, should be made with a common shovel plough, which should be filled with this vegetable matter and listed in, leaving the remainder of the beds to be thrown up, just before planting, thus making loose and fresh the soil in which to plant.

The advantages accruing from this system of manuring are worthy of special notice. In the first place: at the time of planting, decomposition of the vegetable matter is progressing; emitting a warmth even to the surface of the beds, which is very advantageous in cold and wet springs, to the early sprouting of the seed, and sending forth its feeble buds. In the second place: it reclaims the tired and exhausted lands, enriching and fertilizing them, though planted a number of years successively in Cotton.

Having thus prepared the soil, your Committee proceed to the selection and preparation of the seed, and give as the result of their observation and experience, that the Petit Gulf and Alverado seed are superior to any other kind; both yielding about the same quantity of Cotton; the latter the greatest number, but the former the largest bolls, and thereby preferable. The black or green seed should with great care, be prevented from mixing with the white; because when planted, the earth lying closer, the rind of the former, being thinner, they will come up sooner; and from their being tougher, or perhaps more acclimated, will grow off faster; consequently from their flourishing appearance, these stalks are left at the first or second hoeing; and will invariably yield less, being more subject to rot, rust, &c.

Your Committee would recommend that in the preparation of the seed, they should be thoroughly rubbed in ashes for reasons not to be altogether overlooked: 1st. They are more easily and regularly dropped. 2d. They are more closely pressed by the soil. 3d. They receive a kind of vivifying or enlivening influence from the ashes in which they are enveloped, causing them to put

forth and grow with more strength and vigor. 4th. The ashes prevent the ravages of the caterpillar and other insects.

Your Committee would remark, that they have invariably prepared their seed as above recommended; that they have frequently examined, yet never found, the worm (so repeatedly observed by others) in the pith of the old Cotton stalks. Other advantages, in the opinion of your Committee, may be derived from ashes. It is one of the best manures within the reach of the Cotton planter in this section of our country; correcting in some measure the too great tenacity of clay, and the too great perosity of the sandy soils. Also, there are spots in many of our Cotton fields, subject annually to the *rust*, owing doubtless to some *mineral* (principally iron ore in this section of our State.) By the alkaline principle of ashes, this may be neutralized, and the rust prevented.

The Committee will now proceed to the very important process of planting; and among the various systems which have been practised, that of *nibling* or spotting deserves our highest consideration. An instrument of an Ax-shape, with a handle and a finger marking the exact distance the Cotton shall stand in the drill, deserves our serious attention. Having thus prepared an instrument to open holes, the seed may be deposited and covered either with foot or hand rake.

The Committee are aware, that the tediousness of the plan may be objected to; but this objection carries but little weight, when compared to its many advantages:—1st. The great facility of working. 2nd. The lively appearance and more speedy growth of the young Cotton. 3rd. The less liability to die from cold rains, dews, &c. &c. However, if the planter is determined to pursue the old and trodden tract, marked out by his father, he must with a small scooter or coulter-plough, open a shallow furrow, into which the seed must be sprinkled as thinly as possible to insure a sufficient stand under many contingencies; cover with a harrow or light board, with great care to preserve his beds. But your Committee would take the liberty to remark that any innovation upon our revered ancestors, by way of improvement, is no disparagement to their well earned reputation.

The working process should commence as early as practicable; the sooner Cotton is brought to a regular stand, the more lively and vigorous its growth and the *sooner its maturity;* and your Committee doubt not, but that half a man's crop may, with sufficient safety, against frost, cold rains, lice and other contingencies, be brought to a regular stand of one stalk at the first hoeing.

The Committee would respectfully suggest that the first work done to a Cotton crop, be with a plough; and as there is many conflicting opinions on this part of the subject, they would recommend that this ploughing be effected, with what are commonly called Scrapers or Sweeps, which consists of nothing more than

wings attached to common scooter-ploughs. Thus the beds, for which we earnestly contend are preserved.

With this plough, two furrows in a row will suffice to scrape off all the young grass in the middle of the rows, and mingle a small quantity of loose soil, amid the young Cotton. This may be effected without tearing down the beds; should however the beds become hard, or the earth cemented, as is frequently the case in our clay lands, they must be broke and the young Cotton sided, either with a scooter or the bar of a twisted plough; but your Committee contends most strenuously, not only from observation and experience, but upon every principle of reason and analogy, that when the beds keeps loose and mellow, it is unnecessary and indeed injurious to plough them down at all. Hoeing should follow ploughing as soon as possible, chopping through and thinning at first to two and three afterwards to one and two stalks.

The regular distance however to which Cotton should be reduced, must depend entirely upon the quality of the soil in which it is growing; but the most usual distance in this country is from 6 to 18 inches, in the drill, and from 2½ to 3 feet in the row. There is one unerring rule by which the Cotton grower must be guided, viz.: his Cotton must have sufficient distance for the admission of the genial rays of the sun and the free circulation of air. The second ploughing should be deep and thorough, throwing as much loose earth to the young Cotton as it can well support. The hoeing likewise should be thorough and systematic, b.inging the Cotton to a regular distance of one stalk, *cutting every sprig of grass*, and adding dirt to the Cotton. The third ploughing and hoeing should not be dissimilar to the second.

Should the planter be reduced to the necessity from grass and weeds, to plough his Cotton a fourth time, it ought to be done with scrapers, by deep ploughing late in the season, the Cotton is kept growing, and its early maturity interrupted; but earlier in the season, no one will presume to doubt the propriety of deep ploughing. It turns up and brings in contact with the fibrous roots of the Cotton, many of the nutricious qualities of the earth, which could not be effected by shallow ploughing. also it has greatly the advantage in preventing lands from washing.

The Committee takes the liberty to remark, that Cotton ought not to suffer a single day for work, because it is destructive to the best interest of any planter, to have its growth retarded; but to push it by every possible means from its commencement till it is laid by; causing its early blooming and early maturity; and have it thus early prepared for frost, is one of the most essential duties of the Cotton grower.

The Committee would again remark, that if the planter can so manage his Cotton crop, as to procure blossoms between the 15th and 20th of June, and frost should keep off till about the same

time in October, under ordinary seasons and circumstances, he may calculate on a good crop; but if killing frost should fall by the middle of October, and he has so neglected his crop, as not to obtain its early maturity, he may rest assured under the best seasons, his crop in this climate, will be short.

Your Committee recommend deep and early topping of Cotton, thereby throwing the sap more immediately into the branches, causing the bolls to grow larger and mature sooner.

The process of picking should commence early, and too much care cannot be taken in the operation. It is a fact, that no one will for a moment doubt, that the certainty of obtaining the best market price, depends greatly upon the pains taken in picking, in separating the stained from the white Cotton, and avoiding the trash.

The Committee recommend, that the yellow or stained Cotton should be separated from the white, even after it gets into the gin-house, should they be unavoidably mixed during the picking. Small hands may be appropriately employed in this business; and all hands might be thus employed on wet days. Your Committee speak from experience, in saying the difference in the market price, between the stained and fair Cotton is very trifling when in separate lots, but when mixed, it is astonishing how the sale of the whole is injured, a "little leaven leaveneth the whole lump." Certainly no one is so totally blind to his own interest, as to mix his frost-bitten Cotton, with any other kind.

During the picking process, your Committee would recommend to keep as nearly as possible apace with the opening of the Cotton, avoid storms, rains, &c. Should any Cotton be gathered too damp for the gin, they recommend it to be dried in the shade, rather than the sun, for the obvious reason that the sun will bleach, and bleached Cotton will not command as good a price in market, as the rich cream colored.

In ginning too much care cannot be taken; if it be done carelessly, when the Cotton is either too damp or too dry, its staple is injured and price diminished.

In conclusion, your Committee would most respectfully recommend, that no planter should sell his Cotton immediately after the samples are drawn from the hard pressed bags. It is astonishing to see the difference in their appearance in one day, or even a few hours, after exposure to the atmospheric air.

S. V. CAIN, *Chairman.*

[*Edgefield Plough Boy.*

COWS FOR THE DAIRY.

IN selecting cows for the dairy, the following indications should be attended to:—Wide horns, a thin head and neck, dew-lap large, full breast, broad back, large deep belly; the udder capacious but not too fleshy; the milch veins prominent, and the bag tending far behind; teats long and large; buttocks broad and fleshy; tail long, pliable, and small in proportion to the size of the carcas, and the joints short. The Alderney breed gives a very rich milk. The Durham short horns, however, exceed them as respects quantity; and we have the testimony of the Hon. Levi Lincoln, late governor of Massachusetts, that the milk of Denton's progeny, a branch of that race, is not only abundant, but of excellent quality.

Cows should be milked regularly morning and evening, and as nearly as may be at the same hours. At six in the morning and six at night, is a good general rule, as the times of milking will be equi-distant from each other. But if they are milked three times a day, as Dr. Anderson recommended, the times may be five, one and eight. He asserted that if cows were full fed, they will give half as much again if milked three times as if only twice. At the same time, it would prevent too great a distension of their bags, to which the best cows are liable.

The cow which is desired to remain in perfection, either for milking or breeding, should not be exhausted by drawing her milk too long after she becomes heavy with calf. It is paying too dear for a present supply of milk. She should be sufferred to go dry at least two months before calving.

The expense of keeping cows of a poor breed is as great and sometimes greater than that of keeping the best. If cows are poorly kept, the difference of breeds will scarcely be discernible by the product of their milk. Some have therefore supposed that it is the food alone which makes the odds in the quantity and quality of the milk. This supposition is very erroneous, as may be shown by feeding two cows of a similar age, size, &c. on the same food, the one of a good breed for milk, and the other of a different kind, and observing the difference in the milk product. No farmer, unless he is very rich, can afford to keep poor milch cows. He might almost as well keep a breed of naked sheep, such as Swift mentions in Gulliver's Travels. The farmer who raises a heifer calf that is from a poor milker, or of a breed of little value, is as foolish as he would be, if, in clearing land, he should burn on the ground the birch, maple, and walnut, and save white pine and hemlock for fire-wood. And yet many sell the calves of the best milch cows to the butchers, because such calves are fattest!

Those cows which give the greatest quantity of thin milk are most profitable for sucking calves, for rich milk is said not to be so

proper food for calves as milk which is less valuable for dairy purposes. Milk which contains a large proportion of cream, is apt to clog the stomachs of calves; obstruction puts a stop to their thriving, and sometimes proves fatal. For this reason it is best that calves should be fed with the milk which first comes from the cow, which is not so rich as that which is last drawn.

Mr. Russel Woodward, in the "Memoirs of the New-York Board of Agriculture," says, "I have found that young cows, the first year that they give milk, may be made, with careful milking and good keeping, to give milk almost any length of time required. But if they are left to dry up early in the fall, they will be sure to dry up of their milk each succeeding year, if they have a calf near the same season of the year; and nothing but extraordinary keeping will prevent it, and that but for a short time. I have had them dried up of their milk in August, and could not by any means make them give milk much beyond that time in any succeeding years."

A writer in the "Bath and West of England's Society's Papers," states, that if at any time a good milch cow should go dry before her milk is gone, get a young calf and put it to her, in order to preserve her milk against another year; for it is well known if a cow goes dry one year, nature will loose its power of acting in future.

Cows should be treated with great gentleness and soothed by miid usages, especially when young and ticklish, or when the paps are tender; in which case the udder ought to be fomented with warm water before milking, and touched with great gentleness, otherwise the cow will be in great danger of contracting bad habits, becoming stubborn and unruly, and retaining her milk ever after. A cow never gives down her milk pleasantly to a person she dreads or dislikes. The udder and paps should be washed with warm water before milking, and care should be taken that none of the water be admitted into the milking pail.

The keeping of cows in such a manner as to make them give the greatest quantity of milk, and with the greatest clear profit, is an essential point of economy. Give a cow half a bushel of turnips, carrots, or other good roots per day, during the six winter months, besides her hay, and if her summer feed be such as it should be, she will give nearly double the quantity of milk she would afford if only kept during the winter in the usual manner; and the milk will be richer and of better quality.

Tho carrots or other roots, at nineteen cents a bushel, amount to about eighteen dollars; the addition of milk, allowing it to be only three quarts a day for three hundred days, at three cents a quart, twenty-seven dollars. It should be remembered, too, that when cows are thus fed with roots, they consume less hay, and are less

liable to several diseases, which are usually the effects of poor keeping.

The keeping of cows is very profitable. Allowing one to give only six quarts a day, for forty weeks in each year, and this is not a large allowance, her milk at two cents per quart, will amount to upwards of thirty-three dollars; which is probably sufficient to purchase her and pay for a year's keeping.

A farmer some years since kept eighteen cows on a common, and was often obliged to buy butter for his family. The common was enclosed, and the same person supplied his family, amply with milk and butter from the produce of four cows well kept.

Great milkers seldom carry much flesh on their bones, but they pay as they go and never retire in our debt. The difficulties in cow-keeping are these: the expense of their food is considerable, more especially with respect to any which must be purchased, and if the produce be inconsiderable it may be a losing concern. You may be feeding a sparing milker into flesh, and if you stint her or allow her only ordinary food, you get neither flesh nor milk.

Amateurs in this line should procure the largest milkers, and I had almost said, give them gold, could they eat it. In this case it may be depended on, milk is always of more value than the best cow food; and a cow, the natural tendency of which is to breed milk, will convert all nourishment, however dry and substantial, into that fluid; in fact, will require such solid kind of nourishment to support her strength and induce her to take the bull. *(Mowbray on Poultry, &c.)*

Keep no more cows than you can keep well:—one cow well fed, will produce as much milk as two indifferently treated, and more butter; and if the cow be wintered badly, she will rarely recover during the succeeding summer so as to become profitable to the feeder. Cows should by all means be housed in extreme weather, and particularly those which give milk, or a failure in the quantity of milk will be experienced. Wherefore, instead of keeping twenty cows poorly fed, and but half of them stabled, sell ten, and give the remaining ten food in amount equal to what the twenty originally had; procure constant stabling for them, and you will receive quite as much milk and butter in return as was derived from the former mode of treating twenty. Sweet potatoes, carrots, pumpkins, and ground oats, are unquestionably among the best articles for food for milch cattle; and they occasion the milk and butter to assume a fine flavor and color, as well as increase of quantity. *(Trenton Emporium.)*

Pure water is an essential article for cows. Of this they should have a continual supply.

The following prescription for drying off cows, is given in Monk's Agricultural Dictionary: Take an ounce of powdered alum; boil it in two quarts of milk till it turns to whey; then take a large

handful of sage, and boil it in the whey till you reduce it to one quart; rub her udder with a little of it, and give her the rest by way of drink; milk her clean before you give it to her; and as you see need repeat it. Draw a little milk from her every second or third day, lest her udder be overcharged.

The day and night after a cow has calved, she should be kept under cover, and her drink should be lukewarm.

[*Fessenden's Complete Farmer.*

STEAMING OF CORN STALKS AS FOOD FOR CATTLE, &c.

The dreadful mortality from famine among the cattle to the eastward during the past winter, seems to call upon every one engaged in agricultural pursuits to fall upon some plan of economizing the food destined for Winter use. This course is alike dictated by interest and humanity, and will, we sincerely trust, receive all proper attention from those who are to be affected by it. With this brief introduction, we will state a simple fact, which will go far to show how much may be gained by adopting an enlightened system of feeding. During the past season, protracted, cold and cheerless as it was, the large and beautiful herd of Devons at Brookland Woods, the seat of Mr. Richard Caton, near this city, were fed upon steamed corn stalks and Ruta Baga. This was not the result of scarcity, but a matter of choice, for the fine meadows belonging to the estate yields ample supplies of the choicest Timothy hay, and have been celebrated for years, for their great productiveness. The enlightened proprietor of this fine estate conceived the opinion that by submitting the corn stalks to the action of heat in the process of steaming he would be able to restore to them much of that sugary property that renders the stalk in its young and green state, so much the favorite with the human palate, and that thus its nutritive powers would be brought into activity. The result of his winter's feeding has not only been highly gratifying to him as affording a most happy illustration of the justness of his views, but it has enabled him to get his stock through the winter in good and vigorous health and thriving condition, with a saving of from 45 to 50 tons of Timothy hay. After stating this fact, it may be considered as a matter of concern to know how he prepares his stalks, and under that impression, we will briefly state the manner of his doing so. The stalks are first cut by a straw-cutter into the proper lengths, and are then steamed and fed to his stock.—The process is as simple as can be desired, and costs but a few hours labor each day; and it should be borne in mind, that this labor is required to be performed mostly in the dead of winter, when, on all large estates at least there are many hands idle, so that it is no additional tax whatever upon the proprietor of the farm by way of labor. [*Farmer and Gardener.*

CORN COBS FOR CATTLE.

C. T. Botts—My Dear Sir—I am much pleased with your recommeudation of cob-meal in the last number of the *Planter*. I am perfectly satisfied of the value of it. Having understood that Col. Burfoot, of Chesterfield, never wasted a cob, but considered it capital feed, I took some pains to discover his mode of using them. It is as follows: Whenever he shells corn for mill, the cobs are thrown into a half hogshead of salt and water, to which his cows have access. By the time he sends to mill again, there is plenty of room for more cobs. I have tried this plan with great success. The cobs are hardly soaked by the salt water, before they are eagerly devoured by my cattle. I would as soon think of throwing away my fodder as my corn cobs.

Yours, A. B. S.

We have understood, upon inquiry, that Col. Burfoot now boils his cobs, instead of soaking them. He breaks them with an axe, and throws them into his feed kettle, and we are assured that there is no portion of its contents that are preferred to these bits of corn cob.

These plans are no doubt both good; much better than throwing away an article which contains so much nutriment; but, where it could be done conveniently, we should greatly prefer to relieve the animal from the labor and trouble, which he frequently only half performs, of grinding the cob. Besides, when ground, it is food for either horse or cattle. If its nutritious qualities are admitted, there is surely as much reason in grinding the cob as in grinding the grain. [*Southern Planter.*

SHUCKS.

Mr. J. A. Grimes, of Horrodsburgh, Kentucky, gives the following as his method of feeding milch cows:

"We procure in the fall, all the corn-shucks we can, as the farmers put little value upon them. When we commence feeling, we have a large kettle in which we can heat water, and a basket holding the quantity we intend for each animal. We then take the shucks to a common cutting box, and cut them as you would hay or oats, and scald them a few minutes in the kettle. Then take them out and sprinkle three quarts of meal to the bushel of cut shucks, and you will have a better feed than three gallons of corn or meal, fix it as you will. When I was last in Mississippi, the corn crop was very short, and I suggested this way of feeding

to some of my friends, for feeding mules and horses as well as milch cows, and before I left, was told the cows had improved very much in the quality as well as the quantity of their milk."

[*American Farmer.*

We can, from experience, fully sustain the assertions of Mr. Grimes. [*Southern Planter.*

FATTENING ANIMALS.

THERE are some rules which may be advantageously adopted in feeding animals, which however obvious they may be, are too often passed over or neglected. Some of these will be specified; and

1st. *The preparation of Food.*—This should be so prepared that its nutritive properties may be all made available to the use of the animal, and not only so, but appropriated by the least possible expenditure of muscular energy. The ox that is obliged to wander over an acre to get the food he should find on two or three square rods—the horse that is two or three hours eating the coarse food he would swallow in fifteen minutes if the grain was ground, or the hay cut as it should be—the sheep that spends hours in making its way into a turnip, when if it was sliced it would eat it in as minutes—the pig that eats raw potatoes, or whole corn, when either cooked, could be eaten in one quarter of the time now used, may indeed fatten, but much less rapidly than if their food was given them in a proper manner. All food should be given to a fattening animal in such a state, that as little time and labor as possible, on the part of the animal, shall be required in eating.

2nd. *The food should be in abundance.*—From the time the fattening process commences, until the animal is slaughtered, he should never be without food. Health and appetite are best promoted by change of food rather than by limiting the quantity. The animal that is stuffed and starved by turns, may have streaked meat, but it will be made too slowly for the pleasure or profit of the good farmer.

3d. *The food should be given regularly.*—This is one of the most essential points in feeding animals. If given irregularly, the animal indeed consumes his food, but he soon acquires a restless disposition, is disturbed at every appearance of his feeder, and is never in that quiet state so necessary to the taking on of fat. It is surprising how readily any animal acquires habits of regularity in feeding, and how soon the influence of this is felt in the improvement of his condition. When at the regular hour the pig has had his pudding, or the sheep his turnips, they compose themselves to rest, with the consciousness that their digestion is not to

be unseasonably disturbed, or their quiet broken by unwonted invitation to eat.

4th. *The animal should not be needlessly intruded upon between the hours of feeding.*—All creatures fatten much faster in the dark than in the light, a fact only to be accounted for by their greater quiet. Some of those creatures that are the most irritable and impatient of restraint while feeding, such as turkeys and geese, are found to take on fat rapidly when confined in dark rooms, and only fed at stated hours by hand. There is no surer proof that a pig is doing well, than to see him eat his meal quickly and then retire to his bed, to sleep or cogitate until the hour of feeding returns. Animals while fattening should never be fed at unseasonable hours, and above all things, never be allowed to want for food.

SALTING HORSES.

A curious fact is mentioned in Parker's Treatise on Salt:—"A person who kept sixteen farming horses, made the following experiment with seven of them which had been accustomed to take salt with their food. Lumps of rock-salt were laid in their mangers, and these lumps, previously weighed, were examined weekly, to ascertain what quantity had been consumed, and it was repeatedly found that whenever these horses were fed on old hay and corn, they consumed only from 2½ to 3 oz. per day, but that when they were fed with *new* hay, they took 6 oz. per day." This should convince us of the expediency of permitting our cattle the free use of salt at all times, and it cannot be given in so convenient a form as rock-salt, it being much more palatable than the article in a refined state, and by far cheaper. A good lump should always be kept in a box by the side of every animal, without fear that it will ever be taken in excess. [*Farmers' Cabinet.*

POULTRY.—EGGS.

AMONG all nations throughout the globe, eggs and poultry have long been used, and highly prized as articles of food. But for lack of information, or the bestowal of proper attention in the management of fowls, the small quantity and high price of eggs in New-England markets, during the winter season, cause most persons in moderate circumstances to do without them, while those of larger means use them as expensive luxuries. This, it is believed, is quite unnecessary; and as the Yankee Farmer is ardently devoted to all good improvement, I propose to give in its columns, a few practical hints, which are the result of personal observation and experiment.

The first important requisite in *henology* is, to provide suitable shelter. As cheap and good a method as any is, to erect a shed or 'lean to,' attached to a barn or other building; the size for thirty hens and three protectors of the flock, should be twelve feet long and eight feet wide, with the earth for a floor. The south side should have rather large openings for glass windows—(these windows may be used for the hot-bed in the spring and summer)—in the winter, and grates in the summer.

At the north side of the room, there should be built at one end, rows of boxes for nests, the number of nests to be about three-fifths of the number of the flock, leaving a small passage near the end wall, just sufficient for a person to pass between the wall and the edge of the nests, for the purpose of sweeping, cleansing and white-washing it; and allowing the nests to project into the room in the centre, where they should be well boarded and secured by lids to cover the nests from sight. The passage spoken of would form a sort of alcove, with the nests presenting a front towards the wall; but by lifting the lids of the nest, a view of the nests may be had, and the eggs obtained from the back of the nests towards the centre of the room. This passage should be garded at the entrance by a door with an aperture at the bottom, sufficiently large to admit the easy passage of the largest member of the flock; and should also be lighted by a small window in the north end. The hen is a prude and delights in secrecy and mystery about her nest, and if watched, and without the advantages of such concealment as is agreeable, will cease laying.—She is, moreover, like certain politicians in public life, delighted at the chances to "dodge;" and to please her in this particular, an aperture should be made near the floor at the north end of the passage for her to retreat into the centre of the room, so that on finding herself pursued in the passage, she may dodge out, without being obliged to fly over the person's head or between his feet. This method of arranging the nests secures all the desired advantages of secrecy and security, although the hen were as fastidious as a hypocrite.

The hen-house should be provided with large boxes, which for thirty hens, should be each about three feet square and one foot high. One to contain wheat or corn and oats; another, dry sandy soil and wood ashes; another, old lime, mortar, small light colored pebbles or gravel, pounded crockery, glass ware, bones, and clam and oyster shells; all or either of them, as they may be convenient; and the other to receive the crumbs from the kitchen. A trough cut from solid timber, will be found the best vessel to contain water, as it will not be likely to leak, and in the winter season the ice can be cut from it without injury.

Neither of the boxes should ever be filled more than half full, or suffered to become quite empty; for if filled, the hens will waste their food—and if allowed to become empty, they will miss their

supply of food, and when again supplied will eat too much, in expectation of another similar famine.—By keeping a supply before them they will pick what they need, consume much less food, and keep in better condition than when fed occasionally, though plentifully. The soil and ashes are necessary for the hens to dust themselves in; and the lime and pebbles, to aid in the digestion of their food, and to supply shells to their eggs.

Hens suffer from vermin when shut up in filthy pens, and care should be exercised to keep their room clean and sweet, by sweeping, changing the litter in the nests, and whitewashing every part in a thorough manner. A sick hen is always dirty, and a dirty hen is very liable to become sick. The cottagers of Scotland always have eggs in abundance, and of superior quality; and the reason assigned is, that the hens share the dwelling of the owner, and lay their eggs among the clean straw of the children's crib.

There should be affixed near the roof of the hen-house, several poles for roosts, under which should be a scaffold for holding the manure. This manure is highly esteemed by many as a dressing for onion beds, and I believe is sometimes used in the arts. At one corner of the room there should be a ladder, reaching from the floor to the ends of the roosts, at an angle of about forty-five degrees, for the accommodation of young pullets and heavy old hens, and for those who, for reasons best known to themselves, come down from the roost at too late an hour for them to fly to their places again.

When the owner desires to raise chickens to increase his flock and supply his table, the period from the last of March to the first of June should be taken for setting the hens, and a larger number of eggs than usual allowed to remain in the nest.—When a hen clucks, and remains on the nest, instead of allowing her to set in that situation where she will be constantly liable to disturbance from other hens, I prepare a hard smooth nest in a box, in which I place the eggs, and in the evening I raise the hen, remove the eggs that are under her, put the hen in the box I have prepared, and the box in the original nest. By the next evening the hen has become attached to her new nest, which may then be removed to some secure place, away from other hens, and where she may find room for exercise and a supply of food and drink. I have frequently used empty flour barrels as shelter for setting hens, by turning them down upon the side in the yard, and placing the box inside. There is quite a benefit in setting a number of hens at the same time, as advantage may be taken of their simultaneous hatching to put two broods of chickens to one hen, and remove all the unhatched eggs to the nest of a setting hen, as there is frequently several days' difference required in perfecting the operation of hatching. The depraved disposition and careless habits of some

hens at times, makes such a course desirable, as they appear to be entirely deficient in the organ of *philoprogenitiveness.*

Chickens may be weaned when from four to six weeks old, by providing them with an enclosure to protect them from the attacks of the older fowls, who acknowledge no right but that of might; and also, so far removed from the mother-hen as to be beyond the sound of her chuckling. Without some efforts to wean the chickens, the mother-hen will keep from laying a long time, and labor to procure subsistence for her brood when there is no occasion for it.

When it is desired that a hen should not set, although disposed to do so, it is only necessary to confine her with one or two others and a protector, in a box having grates on one side, and feed them well for two or three days, when she will return to laying again.

I have already intimated the food that should be furnished to hens, but that I may be distinctly understood, I will state my own practice, and some of the results. I procure pinched wheat and seeds thrown out by the cleansers at a flour-mill, for the principal food of my hens, throwing into the box occasionaily a peck or two of corn and oats. For my chickens, I prepare a dough of boiled potatoes and corn meal, until they are a week or two old, when I feed them with wheat and such crumbs as are made in the kitchen. With this method of feeding, I have obtained from something less than one hundred and fifty laying hens, over nineteen hundred eggs in the month of January, a month selected as usually the most unpropitious in the year. My estimate of the cost of eggs through the year, is four cents a dozen; and chickens weighing one and a half pound each, six cents.

In my management of hons, I find great pleasure as well as profit. It is my invariable practice, in my visits to the hen-house, to treat them with a little music, in the way of a familiar whistle. This becomes to them, in a short time, a well known call, and I have often "put out my whistle" in a hearty laugh, to see my flock of nearly two hundred fowls flying towards me from all directions, when I have whistled for them. To make this signal effectual, a few crumbs of grain should be thrown to them as an encouragement. In the winter I never allow my hens to go out upon the snow, excepting in moist warm days; and in the summer I let them out every day just before sunset, when they hurriedly range through the garden in search of bugs, grubs and grass, but are too sparing of time to attempt scratching the beds.

Willis, in one of his letters published in the New-York Mirror, gives an amusing and graphic description of the character and habits of a protector of a barn-yard flock. But divested entirely of the ideal, there will be found as great a difference in the health, habits and disposition of different hens, as in their size or color. These differences may be easier learned and better understood by the attentive observer, than they can be described. Of the breed

of hens, however, I give a decided preference to what is called, for what reason I know not, the Poland hen.

With such arrangements as I have mentioned, or a similar plan in a barn or wood shed chamber, every family in a city or village, may, at a trifling expense, keep at least twenty hens, that will furnish each year about three thousand eggs, and not far from two hundred plump, full grown chickens for the table. Yet farmers and others have kept hens ranging through their barns, destroying their hay and grain, and scratching and destroying their gardens, proving an unprofitable pest to themselves and a nuisance to their neighbors, when by proper management all these troubles would be avoided, and the fowls would form a source of enjoyment and profit, of too much profit for any thrifty farmer or good natured married man to dispense with.—J. S. S. [*Yankee Farmer.*

Bangor, Maine, 1841.

PLAN TO REMOVE STUMPS.

Mr. Editor,—Although I am not myself a practical farmer, yet I love to see all the operations on a farm carried on with neatness and economy. I own a small farm of two hundred acres in Champaign county, and when I purchased it, the fields were greatly disfigured and encumbered with dead trees standing, and with stumps. I wish that I might have the pleasure of your company over the farm, or indeed at the house (for every field can be seen from the door) to show you the excellent condition which it is now in. There is scarce a stump or bush to be seen, except some very handsome shade trees purposely left for sheltering the cattle in the heat of summer.

The removal of these stumps has been accomplished by a very simple and economical process, which I will attempt to describe, in the hope that it may be beneficial to those who have their lands encumbered with trees and stumps. Procure a dry red-elm lever, about twenty feet long, and about six to eight inches in diameter—a good stout log chain, with two yokes of oxen; this is all the *machinery* that is necessary. The mode of operation is thus: wrap the long chain around the stump a little above the ground, and make what is called a log-hitch; lay the lever horizontally on the ground, the large end next to the chain and against the stump; make the other end of the chain fast to this end of the lever, drawing the lever tight against the stump; the cattle are hitched to the small end of the lever and driven around the stump, in a circle of which the lever is the radius. One revolution of the oxen around the stump will generally twist out the largest of them; but should not the power thus applied be sufficient to move the stump, the side roots may be uncovered and cut partly off; after this is done, the stump will be easily removed. You will find this plan much preferable to any "patent stump extractor" that you may have seen puffed in the papers. [*Western Farmer & Gardener.*

HORTICULTURE.

VEGETABLE GARDEN.

POTATO—(*Solanum.*)

[CONCLUDED FROM PAGE 599.]

General culture of the early and late kinds of potatoes.—For the first early crop, either for the private market or cottager's garden, the following sorts are recommended:—Ash-leaved Kidney, Foxe's Seedling, Early Manley, and Shaw's Early: they succeed each other, and are much esteemed in the London markets.

For planting these early sorts, if on a small scale, when the plough is not used, deep drills should be drawn at eighteen inches' distance, and the sets put in from eight to ten inches asunder; but more or less depends on how long they are to remain. In setting, let the sprout or eye be uppermost; and in respect of manure for this crop, if the land should be in good strength manure may be omitted, the earth being drawn carefully over them. By this method of planting, the sets will come up more regularly, as well as the crop earlier, than when planted in a promiscuous manner, many with the bottom part upwards.

As soon as the plants are discernible, the hoe should be used carefully, and as deep as possible. In about a fortnight or three weeks, more or less according to the weather, the same operation should be repeated; and when the plants are eight or ten inches high, a little earth drawn up on each side will be of service, but if this is not done, they will be the sooner in want of a final earthing, which should be of a moderate height, and if drawn so as to form a sort of flat surface at top, so much the better, as it contains the moisture better than when drawn to a slope. Some persons allege that the earthing is of no service, and causes the potato to be of a more watery nature. When the whole crop is to be taken off before coming to maturity, and earthing may be dispensed with, but otherwise a full earthing is very necessary.

For planting the large and late kinds of this root, two-feet rows should be allowed, and the sets should be ten to fourteen inches apart; and whatever state the land is in, particularly if it is of a strong nature, manure must be applied, as it leaves the ground in a more pulverised state for any succeeding crop. Should it happen to be the same as that taken off, still a little manure will be necessary.

The author observed, when in Devonshire, the method which the cottagers take in planting their small allotments of land with potatoes, by which he has seen large and fine crops produced. It is similar to the method pursued by the peasants in Ireland, and is

there called the "lazy bed" way of raising potatoes; but the term "lazy" is not properly applied, as much of it consists in hard work.

It is as follows:—beds are marked out from three to five feet wide, according to the nature of the soil, with from two to three feet alleys. The earth of the bed is then thrown out to the depth of four and five inches, and laid on each side: the bottom is stirred up, and the potatoes set from six to eight inches apart entirely over the surface of the bed, and what little manure they can get is sprinkled over them. They are afterwards covered about two inches deep with the earth thrown out in the alleys, and must afterwards have one or two more coverings (the earth being well broken with a spade) should they seem to want it. Where there is plenty of manure to be had for covering the sets, this mode of culture has produced abundant crops.

In many parts of England potatoes are stored in the same field in which they were planted, in moderate heaps or long ridges, covered with straw and earth sufficient to keep out the frost, by which means they keep well, but it is not convenient for turning them over, &c.

RADISH—(*Raphanus.*)

THE varieties of the radish most worthy of cultivation are the following:—

1. Scarlet Short Top.—Of this there are several subordinate varieties; but the scarlet is the leading and best. The short-topped is most commonly preferred by the gardeners near London, as it requires much less room than those with large tops.

2. Purple Short Top: very good and early, but in part superseded by the scarlet.

3. Early Salmon Colored.—A fine crisp radish, and excellent for a second spring crop.

4. Long White Transparent.—A very crisp and delicate variety, which makes a pleasing contrast at table when mixed with the scarlet.

5. Common or Long Purple.—The author recollects this as a leading radish seventy years ago, but it is now principally raised for the seed under the name of salad radish, and for producing the pods for pickling. When the green tops are required for salading, the seed is sown in drills for the plants to be cut young, similar to mustard and cress.

6. White Turnip-rooted is highly esteemed in the spring and early part of summer; when young, it is very delicate and crisp.

7. Red or Crimson Turnip-rooted is held in the same estimation as the last.

8. Black Turnip rooted Spanish.—This sort grows as large as middling-sized turnips; the root is white within, but it has a black

or dark brown skin. They are esteemed by many for autumn and winter eating, for which purpose the roots should be drawn before hard frosts come on, in a dry day in November, and after being divested of their leaves, laid in dry sand, as practised for carrots; if guarded from wet and frost, they will keep good in this way till spring.

9. White Spanish.—This variety is principally cultivated for an early autumn crop, and when grown in a light sandy soil, will be found an agreeable addition to the salading at that season of the year.

Culture.—The soil in which the radish seems to thrive best (either the long or turnip-rooted kind) is a light, rich, sandy loam, dry for early sowings, but more moist for the later.

Few vegetables require less artificial culture than the radish, as the immense quantities sent to the London markets in March and April fully indicate. These are raised in beds, the seeds being sown in January and February, and covered with garden mats or dry straw for protection during frosty nights and bad weather.

When radishes are required early, the seed should be sown in a frame, if there be any to spare, about the end of October, and covered with the lights. The plants usually come up in about a week; and when they appear, the lights should be lifted or taken off occasionally in favorable weather; for if once the plants are drawn (which is the cause of the failure of many crops,) especially if sown on a slight heat, they seldom make much progress afterwards.

Should they be too thick when fairly up, a thinning will be necessary to the distance of an inch and a half; then, over the whole, give a light sifting of dry mould; and by giving air when the weather will permit, and protection from wet and frost, fine young radishes may grace the table at Christmas.

Where there are no frames to spare, the beds may be covered with mats over hoops, and the sides secured by boards and straw-bands.

The best radishes for an early principal crop, are the scarlet long-rooted, and the red and white turnip. These should be sown towards the end of January, if the weather permit, in three or four feet beds, not too thick, in some warm sheltered spot in the garden, and covered with straw or fern (this last, as before stated, is one of the best of coverings, admitting air at the same time that it protects. After the plants are fairly up, they should be carefully covered at all times when the weather is likely to affect them, and frequently looked at, to see that they are not drawn up. When the crops have got their rough leaf, they should be thinned out, where they are too thick, to the distance of two inches, as there will be constantly more thining by the daily drawing of the young radishes.

For successional crops, seed of either of the sorts should be sown once a month or earlier, from February till June, choosing (if it can be had) a moist spot of ground, which will not only forward the growth of the crops, but increase the size of the roots, and render them more mild and crisp in eating: it will also save much watering in the early part of summer; otherwise, in a dry season, the radishes will be hot and stringy.

If the large salmon radish is required, the seed may be thinly scattered among the stationary crops of carrots, parsnips, or such like, and by coming off quickly, will not do an injury; but this practice, especially when there is sufficient room, is not to be recommended.

For raising the two sorts of Spanish radish, the seed should be sown about the beginning of September in beds; these should be thinned to a greater distance than the common sort, as the roots come much larger. If the weather happens to be very dry at the time of sowing, a little moisture will be necessary to cause the seed to vegetate, and it will likewise be of much service to the roots, in rendering them better flavored and more tender.

SALSAFY—(*Tragopogon.*)

SALSAFY is a hardy biennial, a native of meadows in Switzerland, Germany, and of some of the southern counties of England, where it displays its purple flowers toward the end of summer.

It is deemed wholesome and nutritious, and is much esteemed by the higher classes, in whose gardens it is principally cultivated. It has a sweetish delicate flavor, and forms an excellent variety and agreeable side dish for the table, throughout the winter season.

There are several modes of cooking this root; when dressed with cream, they are very delicious; but the following is recommended by the author as one of the best. Previously to boiling the roots, let them be lightly scraped, and then laid in water for about an hour, to draw out any little bitterish taste they might happen to have; this, however, is rarely the case, except when they are grown in moist heavy soils. After the roots have been in the water the time mentioned, they should be boiled till they are quite tender, when they are to be taken out and laid to drain for a short time, during which a thick batter should be made with the yolk of eggs, beat up a little flour, in which the roots are to be dipped, and, after having been rolled in crumbs of bread, fried with a small piece of melted fresh butter, previously put into the pan; they should be frequently stirred, and when observed of a deep brown color, they will be ready for table.

Culture.—The salsafy, as before observed, being biennial, can only be propagated by seed, which should be sown in a light rich

piece of ground, previously well worked to the depth of twelve or fifteen inches, towards the end of February, but not sooner, otherwise the plants will be apt to run to seed. The best way of sowing the seed is in shallow drills drawn about a foot apart, where, after being regularly covered, the plants will soon make their appearance; and if observed to rise in clusters, they must be thinned to the distance of two or three inches, either with the hand or with a small hoe.

In the course of a month or six weeks, they may be finally thinned out to six or eight inches apart. But little more will require to be done, except keeping them clear from weeds, till the end of November; when, after being cleared of decayed leaves, they are to be taken up (taking care not to cut or injure any part of the root,) and laid in dry sand for occasional use throughout the winter. When that season is mild, the roots are apt to take a second and early growth, which must be checked by their being taken out and relaid, otherwise much of their nutritious qualities will be lost. The same holds good in regard to all culinary vegetables of a like nature, when preserved in a dry state under cover.*

Scorzonera may be cultivated and dressed in the same manner as salsafy.

SHALLOT—(*Allium.*)

Shallots have a strong but not unpleasant smell, and are therefore generally preferred to the onion for various purposes of cookery, and for making high-flavored soups and gravies. They are also much used in pickles, particularly in the East Indies; and are considered by many epicures to be the best seasoning for the old English dish of beek steaks.

The shallot was first brought to England in the year 1548; and we may safely conjecture that it soon found its way to the breakfast-table of Queen Elizabeth.

Culture.—The roots of the shallot which are bulbous, increase greatly by offsets, the largest of which are the parts of the plant proper for use.

The bulbs are oblong and irregular, and seldom grow large: as they generally increase into clusters, they do not swell like roots that grow singly.

The soil best adapted for growing the shallot is a light rich sandy loam; but as such soils perhaps are scarce, any light dry soil that has been manured a year or two before will do. They are propagated by dividing the clustered roots into separate offsets, and planting them in very shallow drills from November to January.

* In the lower part of this State the crop for winter should be sown in August, and will stand in the open ground all winter.—Ed. So. Agr.

When planted in autumn in a dry light soil, they often grow larger, and sooner attain full growth the following summer; but one thing must be guarged against, viz., too much wet, which is likely to rot the roots before they vegetate.

The shallots should be planted in the shallow drills about six inches apart, and slightly covered over with earth. Soot, mixed with the surface soil, has been found of much service in preventing the maggot, which often commits extensive depredations upon this plant. The only culture which they require is that of keeping them clear from weeds, by occasional hand-weeding or hoeing.

Towards the end of June, or beginning of July, the bulbs will have attained their full growth, as is seen by the decay of the leaves. They should then be taken up and laid out in some dry loft, when, after being thoroughly dried, picked, &c., they are to be put up in bags, boxes, or tied in bundles by the stalks, where they will remain for some months fit for use.

The author thinks the following method a safe and great improvement in the culture of the shallot; it was communicated a few years ago by A. Knight, Esq., President of the Horticultural Society.

To guard against the maggot in shallots, Mr. Knight had them planted on the surface instead of burying them two or three inches deep in the soil. The experiment was attended with such perfect success, that he confidentiy recommended this new mode of culture to be generally adopted by every gardener. He advises the placing of a rich soil beneath the roots, and raising it on each side to support them, till they become firmly rooted.

This mould is then to be removed by the hoe, and water given from the rose of a watering-pot, when the bulbs in consequence remain wholly out of the ground.

The growth of these plants, Mr. Knight adds, now so closely resembles that of the common onion, as not to be readily distinguished from it, until the irregularity of form, resulting from the numerous germs within each bulb, becomes conspicuous. The form of the bulbs, however, remained permanently different from all he had ever seen of the same species, being broader and shorter; the crop was also much better in quality, as well as more abundant.

The few bulbs which were shown to the author, raised after the above method, certainly surpassed, both in quality and size, all that he ever saw before, or since.

Shallots if wanted early in the summer, may be taken up of a good size in June or July.

The author has been the more diffuse on the culture of this vegetable, on account of the frequent occurrence of a deficiency, arising from various unlooked for causes.

SPINACH—(*Spinacia.*)

THERE are three varieties of the *S. oleracea*, or garden spinach, in cultivation, which differ in the size and shape of the leaves, and the greater or less prickliness of the seeds.

1. Prickly-seeded, or Winter Spinach: the best for winter crops.

2. Round-seeded, or Summer Spinach: preferable for summer crops.

3. Flanders Spinach: a newly introduced variety, sent a few years ago to the Horticultural Society in London. It is said to be superior to the common winter spinach from its not being so apt to run to seed prematurely: the leaves are also much larger, thicker, and more succulent, being of a dark green color, and very luxuriant in growth. The seeds are like those of the summer spinach, but larger. The qualities of this sort must, therefore, be excellent, and will no doubt answer their character in a highly cultivated soil; for in such a soil the author has even had the old well-tried English sorts of an uncommonly large and fine growth.

Culture—The raising of these plants, which are annuals, can only be effected by sowing the seed every year. For an early summer crop the seed should be sown in drills, not too thick, in the beginning of February; and for a succession, once in every succeeding month till May. If a large sowing is required, the drills should be drawn a foot apart; but, as the season advances, there will be room for a drill between various other crops (for such as may be called temporary sowings.) For the principal winter and early spring crops two sowings will be necessary; the first in the beginning of September, the second at the end of that month or early in October.

Spinach succeeds in any common garden soil; but the more it has been previously enriched with dung the better, and, for winter spinach especially, it is hardly possible to manure the ground too highly. Always select an open situation, not too near low spreading trees, &c.; as in close and shady places it is mostly drawn up weak, and soon runs to seed, without attaining perfection.

After the ground has been properly dug, the seed may either be sown broad-cast, in four-feet beds, and raked in, or in shallow drills a foot asunder. If by broad-cast, and more than one bed is required, such should have one-foot alleys: sow all over the surface moderately thin, and if the land is light and dry, it can be trodden down evenly, and afterwards raked over, and, if dry weather, smoothed off with the back of a spade, the better to detain the moisture. If in drills (which is generally practised with considerable advantage,) they should be drawn with a proper drill hoe, two inches deep, and about a foot apart: along each drill scatter the

seed thinly and regularly, and then cover it over with earth, which beat down with the head of a rake, to prevent what little moisture it contains from evaporating too rapidly.

The drill mode is often very proper and convenient in sowing between other crops, as between wide rows of beans, peas, cabbages, &c., as it admits of hoeing up the weeds between the rows with facility; and if sown thin and the plants are thinned out properly, they grow large and fine, and the produce is very conveniently gathered.

The seeds generally come up in a fortnight, or, perhaps, if sown very early in spring, it may be three weeks or a month before they appear.

In respect to the after-culture of the crops, when the plants have three or four leaves an inch broad, they should be thinned out to three inches apart, and cleared from weeds, either by the hoe or hand; but the former will be found the most eligible, especially for the broad-cast sown crops. In about three weeks afterwards, they require (unless it is intended to begin thinning out the plants for use whilst young) to be again thinned out and hoed to six or seven inches apart, especially the spring and summer crops of the Flanders and round spinach, which, having proper room, will grow very large, and spread its broad leaves widely, and does not run to seed so soon as if left close.

When the plants have leaves two or three inches broad, they will be fit for gathering. This is done in two ways; either by cutting them up with a knife wholly to the bottom, or drawing and cleaning them out by the root, or only cropping the large outer leaves, the root and heart remaining to shoot out again. Either method can be adopted, according to the season and other circumstances. The author would suggest to the young gardener, who most likely has a table to serve in the depth of winter, when the ground is covered with frost and snow, whether it may not be necessary, in that season, to have one or more beds of spinach protected with garden mats or some other sort of close covering. Such matters speak for themselves, and require but little consideration, their utility being so obvious.

SQUASH—*(Cucurbita melopepa.)*

VARIETIES.

Early Bush Squash,	Vegetable Marrow,
Early Crookneck,	Winter Crookneck,
Large Cushaw,	Lima Cocoanut.

The several varieties of Squashes are very useful in this and other warm climates, as they can be grown in perfection in the summer, and therefore prove a good substitute for Turnips, which

cannot be raised in perfection in hot weather. They should be planted in hills, prepared in the same manner as for Cucumbers and Melons, and their subsequent management is the same in every respect. The bush kinds should be planted three or four feet apart, and the running kinds from six to nine, according to their nature, as some will run more than others. It is always best to plant five or six seeds in a hill, to guard against accidents; as when the plants are past danger, they can be thinned to two or three in a hill. One ounce of Squash seed will plant from fifty to one hundred hills, according to the sorts and size of the seed.

The fruit of the Early Summer Squashes is generally gathered for use before the skin gets hard, and while it is so tender as to give way to a moderate pressure of the thumb nail. The Winter Squashes should be suffered to ripen, and collected together in October, in the manner recommended in the calendar for that month.

All kinds of Squashes should, after having been boiled tender, be pressed as close as possible between two wooden trenchers, or by means of a slice or skimmer, made of the same materials, until dry, and then prepared for the table in the same manner as Turnips. [*The Young Gardener's Assistant.*

TOMATO—(*Solanum licopersicum.*)

VARIETIES.

Large Squash-shaped, | Cherry-shaped.

THE Tomato, or *Love Apple*, is much cultivated for its fruit, in soups and sauces, to which it imparts an agreeable acid flavour; it is also strewed and dressed in various ways, and is considered very wholesome.

The seed should be sown early in February, in a slight hot-bed, and the plants set out in the open ground, if settled warm weather, in the latter part of March. In private gardens it will be necessary to plant them near a fence, or to provide trellises for them to be trained to, in the manner recommended for Nasturtiums; they will, however, do very well, if planted out four fect distant from each other every way.

Tomatoes may be brought to perfection late in the summer, by sowing the seed in the open ground the first week in March; these plants will be fit to transplant early in April, and the fruit may ripen in time for preserves or catsup.

One ounce of good Tomato seed will produce upwards of four thousand plants; and a single plant has been known to yield upwards of a bushel of fruit.

Tomatoes may be preserved in a stone or glazed earthen pot, for use in the winter, by covering them with water in which a sufficient quantity of salt has been dissolved to make it strong enough to bear an egg. Select perfectly ripe berries, and cover the pot with a plate in such a manner that it presses upon the fruit without bruising it.—Previous to cooking these Tomatoes, they should be soaked in fresh water for several hours.

Besides the various modes of preparing this delicious vegetable for the table, it may be preserved in sugar, and used either as a dessert, or on the tea-table, as a substitute for Peaches or other sweetmeats. It also makes exquisite pies and tarts, and excellent catsup.

A celebrated writer observes, that "the common Tomatoe made into a gravy, by stewing over the fire, and used as a sauce for meat, has been known to quicken the action of the liver and of the bowels, better than any medicine he ever made use of." He states further, that—"When afflicted with inaction of the bowels, head-ache, a bad taste of the mouth, straitness of the chest, and a dull and painful heaviness of the region of the liver, the whole of these symptoms are removed by Tomatoe sauce, and the mind, in the course of some few hours, is put in perfect tune."

To make them into catsup, use one pint of salt to one peck of Tomatoes; bruise them, and let them stand two days; then strain them dry, and boil the juice until the scum tops rising, with two ounces of black pepper, the same quantity of pimento or allspice, one ounce of ginger, one of cloves, and half an ounce of mace.

[*Ibid.*

FLORICULTURE.

CULTURE OF PLANTS.

Sir,—Having disposed of a considerable quantity of plants in pots, and frequent inquiries being made by individuals as to how they should treat the plants in their windows, the idea struck me that it might be satisfactory to all parties, if through the medium of your columns I should throw out a few hints how to manage plants grown in pots. These, of course, must be brief, and of a general character. Plants when growing naturally in the open air have their roots fixed in a body of soil that maintains to some extent a uniformity of moisture and temperature; and one of the principal objects to be gained by tilling the soil is to make it maintain this uniformity in greater perfection, especially as regards moisture. If the soil contain too little moisture, the plants get stunted in their growth; if too much, they get diseased, and languish out a sickly existence. To grow plants in a healthy state it is

necessary that the soil be capable of retaining a sufficiency of moisture, and at the same time let a redundancy pass away, and the larger the quantity of finely pulverised earth that is brought together the better is this accomplished. In dry weather a plot of ground that has been well pulverised to the depth of a foot or more will retain sufficient moisture, and the plants be thriving, when a neighboring piece of ground of the same quality, but left in a comparatively hard unbroken state, will be drained of moisture, and the plants burned up by drought. And in wet weather, soil that is well wrought and pulverised will retain no moisture detrimental to vegetation, when hard unwrought ground will be covered with pools of water. The necessity to the production of healthy vegetation that all redundant moisture be taken away is sufficiently manifested by the large amount of capital yearly expended by farmers and others in draining the soil, a process which, while it is absolutely necessary to good cultivation, is of no other use than to convey away unnecessary and therefore hurtful moisture.

To obtain plants in the greatest degree of perfection, so far as the soil is concerned, all that is necessary is to place them in a quantity of soil containing a sufficiency of nutritive matter, and of a sufficient depth, properly pulverised, so as to retain the necessary quantity of moisture, and at the same time so managed as to let a redundancy of moisture pass away. In the open ground, so far as regards the generality of plants, this is not in ordinary circumstances difficult of attainment: but when the plants are placed in pots the case is altogether altered, and a proper uniformity of moisture can only be obtained by close and regular attention on the part of the cultivator. The body of soil is so small that the proper quantity of moisture by the twofold process of evaporation and of absorption by the plant is soon exhausted, and if an immediate supply is not given the plant is soon injured—if, on the other hand, to save trouble the pot is placed in a flat filled with water, or made so as to prevent the water from passing freely through it, the plant often get sickly and ceases to thrive, in consequence of a redundancy of moisture acting in something the same manner as stagnant water in an undrained field. I am pretty near the truth in saying, that three-fourths of the house plants lost through the season, die in consequence of a want of attention in preserving a proper uniformity of moisture in the soil in which the plant grows. A pot of four or five inches in diameter, if left in a window exposed to the influence of the noon-days sun without a sufficiency of moisture, is soon dried through and through, and the fibres of the plant are injured to an extent that no future attention can remedy—or a plant is kept with an inch or two of water standing in the bottom of the pot, and it gradually decays as the fibres of the root rot away from the action of the unnatural damp in which they are confined. It would be difficult to point out the precise amount of moisture that

is necessary for the health of a plant, some plants requiring more than others; but as a general rule, plants will require a liberal supply of water when in a growing state, and a limited supply when in a comparatively inactive state—a large plant in a small pot will require an abundant supply of water, and a small plant in a large pot the reverse. Plants in the spring and summer seasons, when in vigorous growth, and large plants in small pots, are most liable to be injured by a want of regularity in the supply of water; and plants in the autumn and winter seasons in a state of repose, and small plants in large pots, are most liable to be hurt by an excess of moisture. Different kinds of plants no doubt require different kinds of soil, but for all the plants ordinarily grown in windows, one-half of vegetable mould, one-fourth of common garden-loam, and one-fourth of clean sand, will form a soil in which the plants will thrive luxuriantly--have the pots well drained by placing pebbles or broken pieces of tile in the bottom, and supply water in a regular manner so as to keep the soil in the pot in a uniform state of moisture, taking care to let no stagnant water remain in the flat or about the roots of the plant, and then all is done that is necessary, so far as soil and moisture are concerned. For the healthy growth of plants a free circulation of air and a clean foliage are absolutely necessary in the open air; this is obtained in the most perfect manner by means of the wind and rain. But when confined in a house, especially a dwelling-house in a town, where the atmosphere is still, and often loaded with small, sometimes imperceptible particles of dust, the leaves and stalks of the plant soon get coated over, and the innumerable pores of the leaves are stopped up, and the regular inhalation and perspiration carried on by these organs, and which is necessary to the health of the plant, is in a great measure prevented; the consequence is the sickly existence and ultimate death of the plant. The only efficient remedy for this is to wash the plants frequently with soft water—when the weather is mild give them as free a circulation of air as possible, and put them out when a fresh shower is falling. A very heavy rain, if the weather is fresh, unless the plants are in a forward state of bloom, will do no harm but much good; the object being to keep the plants clean and free from dust, so that the organs of respiration may be able to perform their important functions.

Another enemy to the health of what may not inappropriately be termed household plants, is insects of various kinds. These may often be termed both the cause and consequence of disease; insects tending to destroy the health of the plant, and an unhealthy plant being favorable to the existence of insects. The best method of removing them is to wash the plant well with clean water; this may be performed either with a sponge or a brush, or with many kinds of plants they may be immersed head foremost in a tub full of water and drawn rapidly up and down, with more or less force

as the plant is able to bear it, until the insects are completely removed. In some cases, where the insects are of a description not easily removed, it may be advisable to wash the plants with strong lime-water, which proves fatal to most insects, or at least annoys them so much that they easily loose their hold; but it will be necessary afterwards to wash the plants well with soft water, to prevent any bad effects from the use of the lime-water. All that is necessary to make plants kept in the house have a healthy and cheering appearance, after being planted in soil containing an ordinary amount of nutritive matter, is to keep them regularly supplied with moisture, without letting stagnant water remain about the roots; to keep the foliage clean and free from impurities of every description, and to be careful to remove all insects whenever they make their appearance. Plants in pots, when kept in the window of a house, are like birds in a cage, they require constant and uniform attention; if neglected for a day or two, and sometimes even for a single day, the care and attention of months is lost, and effects produced which no future care can ever remedy. Consequently those who feel it a burden, or something like a task to attend to plants in pots, should give up the matter at once, for they will never succeed. It is those only who feel a pleasure in tending their plants, who feel a sympathy for them as a kind of living beings over whose misfortunes they can mourn, and in whose well being they can rejoice, that ought to have their windows filled with plants. Those who have no such feelings of attachment to their plants, and who are only desirous of a little show, would do well to procure artificial flowers, which will serve their purpose equally well, and only, like any other piece of furniture, require the dust wiped off when they can find it convenient. Hoping you will at your convenience give the above a place in your columns.

I remain, yours, &c., H. Smith, Jun.

Ayton, Sept. 8. [*Berwick Adv.*

EXPOSURE OF PLANTS TO FROST.

In the last volume of the transactions of the Horticultural Society of London, are published Professor Lindley's "Observations upon the effects produced on plants by the frost which occurred in England in the winter of 1837-8," in which some passages of lively interest to the Floriculturist especially, occur. A few of these are selected for the readers of the Cultivator, on the supposition that the great majority of them will not have the opportunity afforded of reading the memoir entire.

The observations were made chiefly upon exotics supposed to be hardy, and plants indiginous to England, growing in the garden of the Horticultural Society at Chiswick, near London. The de-

tails being voluminous, and the remarks on the state of the weather foreign to the purpose of the present extracts, I pass them over, with the single remark, that the greatest cold at the time of the examination was $-4\frac{1}{2}$; and that in the preceding months the rise of temperature above that which was ordinary was sufficient to bring on a more than ordinary excitement in the fluid of plants. The facts which resulted from those examinations, are what I propose briefly to notice—and I here introduce an extract:

"Not the least interesting of the facts observed during the winter was this, that in those places where the cold was *very severe*, the more plants were exposed the less they suffered, and that on the contrary the more they were sheltered without being actually protected artificially, the more extensively they were injured."

Of this a great number of examples are given; and the following elucidation of the principle upon which the result depends is happily expressed. I cannot forbear here calling the attention of Floriculturists, over tender in the care of rare exotics, to the importance of the fact—but to the reasons of it, here they are:

"It is well known that plants in a state of growth suffer more from frost than those which are dormant. * * * * This is undoubtedly owing in a great measure, if not exclusively, to their tissue containing much more fluid when in a growing state than when they are dormant. The more succulent a plant or a part of a plant, the more tender it is under equal circumstances. An oak or an ash, is nearly exhausted of its fluid contents by the leaves before the frost sets in, and, in fact, the fall of those organs in deciduous trees is probably caused in part by the inability of the stem to supply them in autumn with an adequate quantity of fluid food; during the winter, but little water is added to the contents of the stem, until after the severe frosts are past and the return of spring, when the sap is attracted upwards by the budding leaves. The winter, therefore, is the dry season of such plants, and, for that reason, the period in which they are least liable to the effects of frost. But if any unusual circumstance attends this habit, the capability of resisting frost is attended with it; and thus the plants mentioned in the instances lately quoted, stationed in warm sheltered situations, were stimulated prematurely into growth, their stems were filled with fluid, and they were in consequence, affected by frost in a much greater degree than when, from the coldness of a station, they were kept in their ordinary winter condition."

The reasoning is conclusive—the fact important. Of its truth, a thousand illustrations might be given, in the private observations of individuals. I last winter knew a fine lot of *dahlias* destroyed by being placed in a warm chamber, the unequal temperature of which (under the daily kindling and occasional extinction of

fire in the ordinary uses of the family,) caused an unnatural excitement in the fluid of the plants, and a consequently greater exposure to frost when the heat of the room was abated. Edible roots, also, doubtless suffer injury upon the same principle under too much care.

There is one other passage which I will quote in this connection. Dr. Lindley's inquiry into the manner in which the death of plants is caused by cold, is curious and interesting; but the phenomena detailed being rather tedious for an insertion here I ask a place only for the concluding remarks, which follow:

"It is well known that the same plant growing in a dry climate, or in a dry soil, or in a situation thoroughly drained from water during winter, will resist much more cold than if cultivated in a damp climate, or in wet soil, or in a place affected by water during winter. Whatever tends to render tissue moist will increase its power of conducting heat, and consequently augment the susceptibility of plants to the influence of frost; and whatever tends to diminish their humidity will also diminish their conducting power, and with it their susceptibility. * * * The destructive effects of frost upon the succulent parts of plants, or upon their tissue when in a succulent condition, may thus be accounted for, &c. * * * The experience of the past winter shows that the *cultivation* of plants in situations too much *sheltered*, where they are liable to be *stimulated into growth*, and consequently to be filled with *fluid*, by the warmth and brightness of a *mild, protracted autumn*, exposes them to the same bad consequences."

These facts and deductions need no comment. They are worth the attention of the horticulturist, the orchardist, the floriculturist, the vinyardist, the grazier, and of husbandmen at large. They are now *seasonable* and you are welcome to them. B.

[*New Eng. Farmer.*

THE ORCHARD.

A WORD TO FARMERS ABOUT ORCHARDS.

It will be denied by few, or none, that a thrifty bearing orchard is one of the surest and most profitable sources of the farmer's income. It costs, to be sure, labor, care and time to bring it to maturity; but when it *is* brought there it remains for years, requiring each year but little attention, and repaying the husbandman by an ample reward for his pains.

Now if such be the fact, why is it that so few good orchards are to be found among us? Why is it that the old orchards, planted by our grandsires, but sadly thinned by the hand of time and

decay, are still seen, disfiguring many a plain and hill-side, and yielding but a scanty harvest of knurled and diminutive fruit? Why is it that our fathers—nay, that we ourselves have not been up and doing—*doing* each year something to bring forward a new and healthful race of trees?

These questions have often occurred to me, as I dare say they have to others—and several probable answers have also suggested themselves, which it may not be amiss to consider; for the subject, though not new, is so important that it deserves repeated consideration to impress its importance.

Many a farmer declines setting out young trees, for the reason that *he* may not live to partake of their fruit. He seems to reason with himself thus: that as posterity never did any thing for him, so he should do nothing for posterity. But to such an one a better mode of arguing might be suggested, viz.: that as those who lived on this spot of ground before me, have done something for me—something at least, which I now enjoy—so am I bound to do something for those who shall hereafter take my place—or, in other words, if my ancestors had done nothing towards rearing an orchard, I should now have no orchard; so, if I do nothing, in the same way, my children will have none after me. Many of the trees that once stood here, he might say, I have cut down for fuel, so that even when dead I reaped a benefit from them. In the island of Japan, there is a law that no one can cut down a tree without permission of the magistrate of the place, and even when he obtains permission, must *replace it immediately by another.* Now, by the latter clause of this law should every one act who inherits an estate.

But again, how know you that you may not live to enjoy yourself the fruit of your labor? You say that you are old, and the chances are against you; and you reason thus year after year making the chances more against you, and letting opportunities slip by, *opportunities*, which if improved, would turn the scale the other way. But, friend, let me tell you that you are not too old, if you set about the business in good earnest. You do not know how much longer your own life will be extended, and perhaps you do not know how rapidly a young orchard, well taken care of, will tread upon your heels. In the preface to the valuable little work on fruit trees, by Robert Manning, of Salem, he states that it was late in life when he commenced the business of a nurseryman. His friends remonstrated with him on such an enterprise for one of his years, and treated the project as visionary in the extreme. But he still went on, and what is the result? The author tells us that he has lived to sell out many nurseries, and to eat the fruit of many a tree of his own planting. Let me state another case. A venerable clergyman of New-Rowley, Dr. Chandler, lived to partake

many years of the fruit of some chesnut trees, the seeds of which he planted after he was *fifty* years of age.

After instances like these—and they might be multiplied—let us hear no more of the common objection urged against rearing an orchard, that you are too old and shall never live to see it grow up. Go to work at once about it—let your apprehensions give way to anticipations—let *doing* take the place of *doubting*—and in a few years you will have the satisfaction of witnessing a substantial change in your orchards.

But it is not from neglect alone to set out trees, that young and thrifty orchards are so rare. Convinced of the necessity of making a beginning, many farmers procure trees and set them out, and leave them to take care of themselves. The field selected for the purpose, was that year laid down to grass—the following year it is sodded over---and so it remains as long as it continues to yield a fair burden of grass. In the mean time, neither plough nor hoe comes near the roots of the young trees: they are grass-bound as firmly as was Gulliver when tied to the earth by pack-thread: they receive neither heat nor moisture, nor air: nay, they are not supplied with even an *annual* pittance of food. Is it any wonder, then, that they refuse to grow? How can they, when they have not one of the elements to promote growth? and if they had, have not elbow-room to grow in? Ask the farmer why he does not keep the field under cultivation;—he will tell you that it requires too much manure, and he has other fields that need it more. Inquire of him why he does not cultivate at least a small spot around each tree—it is too much trouble, and besides he does not like this forcing the growth of trees; they will run out, he says, faster than they run up.

It is in this starving, neglecting system, as I conceive, lies the great reason that we have so few thriving orchards. Trees—young trees—like corn or potatoes, must have food, or they cannot grow: they must have cultivation, as plants have, or the weeds and grass will choke their growth. Trees, or any of the vegetable race, may be stimulated to excess—become rank and luxuriant, and consequently weak and short-lived. But I have yet to learn that good cultivation and a plentiful supply of manure, are fatal to their health and longevity. Where we have one orchard in danger from these causes, there are hundreds that from the want of them, are in peril of coming to a premature grave. The contrast between orchards well cultivated and those which are not, is so marked and striking, that it cannot fail to attract the notice of every observer. The bark of the former is healthy-looking, smooth and glossy: that of the latter is of a sickly hue, scurfy or moss-covered. The branches of the former present the last year's growth of a great length: those of the latter scarcely give signs of any last year's growth at all. The leaves of the one are large, green, and glisten-

ing: those of the other are pinched, yellowish and dull looking. Effects so different, must proceed from causes as different; and these causes are, in general, none other than the different modes of treatment or cultivation, to which the trees have been subjected. Trees, properly taken care of, will yield fruit much sooner, and of better quality than those which are but imperfectly cultivated; whilst such as are altogether neglected, will linger along only to mock the expectations of their improvident owner.

Another evil to which young fruit trees are too often exposed, even where they are in other respects well taken care of, is the browsing of cattle. For the sake of saving the after crop of grass, many farmers turn their cattle into young orchards, and thus inflict upon them wounds from which they are slow to recover. It is not safe to let even calves or yearlings run where there are young trees. They will get a nibble at them sooner or later. Thus browsed, orchards, if they survive the operation, will be dwarfish and scrubbed. They can be told as far as they can be seen, and it may be safely predicted that they will be as worthless as they are ill-favored. The best course to be taken with them is to cut them off and new graft them. But this again your improvident farmer will not do; it is too much trouble, and if he did do, it would be of no use, as he would again neglect to keep them from being browsed. If such be the frequent fact—and who can doubt it?—we cannot fail to see another cause of the deficiency of good orchards. That deficiency will be supplied, only when young trees are guarded as securely as are corn-fields and mowing land.

But supposing a good orchard transmitted, as many such have been to the farmers of New-England, why is it that they are so fast disappearing? The successive ravages of the canker worm have, in many places, doubtless contributed to this result more than any other cause. Tarring the tree, the only effectual remedy as yet discovered, has in many orchards been successfully practised; but in more instances, from being only occasionally performed, has resulted in little benefit. When the grubs run in large numbers, an omission to tar for a single night, may render abortive the operation, if repeated every other evening in the season. It demands careful watching, both in late autumn and early spring, to detect the day when these prolific marauders take up the line of march. But this early and late watching is what most farmers, will not, or do not, attend to. After the enemy is upon them, then, if at all, they begin to make preparations for on onslaught. I know of a large orchard, once among the most productive and valuable in the county of Essex, now almost good for nothing but fire-wood, from the unchecked depredations of the canker worm.

Look to it, farmers—look to it in season—look to it constantly, that you meet this enemy and vanquish him. One or two yearly battles, vigorously maintained, and you are rid of him. Follow him

up day by day; do not spare the tar for fear either of the expense or of killing the tree. The one is not to be named compared with the benefit you will gain from it. Of the other there is little danger to large trees, especially if the tar be scraped off in summer. Numerous are the orchards destroyed by the canker worm, but I know and I have read of none destroyed by the process of tarring.

ALLEN W. DODGE.

Hamilton, Oct. 20th, 1841. [*New-England Farmer.*

CULTIVATION OF THE PLUM.

Mr. Editor: Sir—I am induced to offer you some observations of mine on the cultivation of Plums. I have taken an interest in the cultivation of fruit for the last eight years, and now have several good kinds in a bearing state. The plum is one of our hardiest fruit trees. During our cold winters I lost pear, apricot, peach and several of the Baldwin apple, by the severity of the cold, but not a single plum tree. Plum trees of almost all kinds are good bearers; they usually blossom full, and the fruit sets well, and it is certainly one of the most delicious fruits we have, when in perfection. The fine kinds are wholesome and salutary, and can be indulged in even to satiety, when fully ripe, without harm. They will grow well in rather a low loomy soil; if the soil is rich, they grow fast and come quick into bearing.

But the grand obstacle in the way of cultivating this fruit, is the depredations of a small insect of the beetle tribe, which commences its operations when the fruit is quite small, and continues them usually till the first of August. This beetle is called by horticulturists the curculio—is about one-sixth of an inch long, has two small bunches or protuberances on its back, and a rostrum or beak, and on this two antennæ. By this rostrum it makes a semilunar incision on the plum, into which it deposits an egg. The egg hatches, producing a worm, or larvæ, which burrows down into the heart of the fruit, eating it through two or three times from end to end. This kills the life of the plum, causing it to wither and fall prematurely: the worm then soon leaves the fruit and enters the ground, where it undergoes a tranformation or metamorphosis, common to the insect tribe, and then comes up a new curculio, to deposite its eggs as before described. Its work is not confined to the plum, but extends to the cherry, peach, and apple, though it would seem to prefer the plum to other fruit, on account probably, of the smoothness of the skin, and the greater ease in making the incision. It is remarkable how general depredations are on the plum tree when unmolested; for when the tree is loaded with fruit, and large, scarcely a single plum will remain unpunctured, and consequently all will be lost to the cultivator.—

Some kinds of peach and apple which have a wooly or furry surface are not attacked. Almost all the wind-fall apples (as they are called) are produced by this beetle, and upon ex amination will be found to contain the larvæ or worm from the egg of the curculio.

The plum tree is subject to a disease on the limbs, a kind of excrescence or warty appearance, which Dr. Harris says is caused by this same curculio, puncturing the tender bark and depositing his eggs under it. "These swellings or warts, are diseases of the bark, caused by the punctures of the weevil, and the residence of the grubs. The sap vessels being wounded and irritated by the insects, throw out an increased quantity of fluid; this is re-absorbed by the bark, which is consequently swollen and thickened in substance; the overstretched cuticle bursts, and the swelling becomes irregular, granulated and full of fissures."

Dr. Harris recommends cutting out and extirpating these excrescences and burning them before the last of June. The wounds made in so doing should be treated with mortar used in grafting.

The character of the curculio is shy and timorous; so much so, it is seldom seen unless hunted after purposely. He is not often seen in motion on the tree, but occasionally in a small crevice or crack, or the axillæ of a limb, and so much does he resemble an old blossom or bud, or a small piece of bark, that he will commonly remain unnoticed. Should the observer extend his thumb and finger to take him, ten to one if he don't elude him, falling as imperceptible as a small shot would to the ground.

The habits of this insect are not well known, I still believe, to fruit growers. I have made frequent inquiry of them for a preventive measure. Some have told me that the insect crawled up the tree, and most of them have never seen it to know it. It is well to remark that it flies on the tree.

The following are some of the means of preserving fruit against the attacks of these insects.

First.—All the premature fruit that falls to the ground with the worm in it, should be immediately gathered and burned. It will begin to fall as early as the 12th or 15th of June, and continue to until the middle of August, if not ripe before. This course, well pursued, will destroy the next generation of them and save the next year's crop.

Second.—Shaking the tree briskly morning and night, and two or three times during the day, will very much discommode and interrupt them from pursuing their operations—for at each concussion of the tree the insects fall to the ground, and if they re-ascend, will soon become discouraged by this course of treatment.

Third.—Let two or three hands take a sheet or sheets and spread under the tree, and then shake and jar it, and they immediately fall, feigning themselves lifeless, and appearing like a shapeless lump, and by those who are unacquainted with them, would

not be taken for an animal until they moved. All that fall on the sheet should be immediately crushed. This last mode of destroying them should be practised twice a day while any are found. In the spring of 1837, I cooped a hen and chickens about an Imperial Gage, whose fruit was destroyed the preceding year, and about all the plums matured on this tree. It is probable that the beetles were destroyed by the brood, as they made their way to the surface of the soil. As this little animal is easily annoyed, trees standing before a store or shop or any frequented place, usually more or less escape injury. I have known trees standing near a hog pen, mature their fruit year after year, while others standing four rods distant, as surely failed.

Mr. Manning remarks in his Book of Fruits, that plums thrive best near the borders of the sea, and that the curculio is said to avoid the salt air.

If the foregoing remarks should prove of any advantage to horticulturists in the protection of fruit from injuries inflicted by this insect, or lead to minuter investigation into its nature and habits, I shall be well rewarded for this imperfect communication.

JOEL BURNET.

Southboro' June 19, 1839.

[*National Ægis.*

TREATMENT OF TREES, &c.

"*On their arrival at the place of destination.*—As soon as the trees arrive at the place where they are to be planted, let a trench be dug in cultivated ground, the bundle unpacked, the roots well wetted, and immediately covered with earth in the trench, observing to make the earth fine that is spread over them, so as not to leave vacancies for the admission of air to dry the roots, it having been found by experience that the thriftiness of trees the first year after transplanting, depends much on the fine fibres of the roots being kept moist, and not suffered to dry from the time they are taken up until they are replanted; their increase, therefore, must depend principally on the subsequent management on their arrival at the place of destination; for if, when the bundles are unpacked, the trees are carelessly exposed to drying winds, the young fibres of the roots must perish, and the trees, if they live at all, cannot thrive the first season, as they can receive little or no nourishment until these fibres are replaced.

"*To cause the Trees to thrive.*—The ground where they are planted must be kept cultivated; young trees will not thrive if the grass be permitted to form a sod around them, and if it should be necessary to plant them in grass grounds, care must be taken to keep the earth mellow and free from grass for three or four feet distant around them, and every Autumn some well rotted manure

should be dug in and around each tree, and every spring the bodies of the Apple Pear, Plum, and Cherry Trees, and others that it is particularly desirable to promote the growth of, should be brushed over with common soft soap, undiluted with water; this treatment will give a thriftiness to the trees surpassing the expectation of any one who has not witnessed its effect. Should the first season, after transplanting prove dry, regular watering will be necessary, as from neglect of proper attention in this respect, many lose a large portion of their trees during a drought."

Such kinds of fruit trees treated on in this work, as may require any other than good ordinary soil, may be supplied, by judicious management; and if a proper attention be paid to the situation and aspect in arranging a Fruit Garden, each kind may be so accommodated as to promote its fruits' ripening earlier or later than the ordinary season, by varying the aspect; but Grape Vines, or other tender fruits, should not be planted where the sun's influence does not fully operate.

Where there is a great extent of close fencing or wall, it is advisable to plant trees of the same kind against different aspects. Such as one or two May Duke Cherries against a South aspect, which will ripen earliest; next against either an East or West, and lastly, against a North aspect; by observing this method with Dwarf Cherries, Plums, Gooseberries, Currants, &c. the fruit will ripen in succession, and thus a supply of them is considerably lengthened. The early blooming fruit trees will sometimes need protection in warm aspects; for which arrangements may be made by keeping awning, matting, netting, &c. at hand, to shelter them with, in threatening weather, or to screen them from the intense heat of the sun after a frosty night; this, with a sprinkling of water, as the air gets warm, will often prevent any serious consequences from slight frost.

Those who have various soils, should suit them to the different kinds of fruit. Apples and Pears require a strong loam, but rather the lightest for the Pear. Apricots, Cherries, Peaches, Plums, and Nectarines, a good deal lighter than for the Apple and Pear.

[*Young Gardener's Assistant.*

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